

Living on the Forests: Women and Household Security in Nigeria

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A survey was conducted to obtain information about the use of forest products by rural women for sustaining food and financial security at household level in the Nigerian rainforest zone. Data analysis reveals that the rural women are heavily engaged in harvesting, processing and marketing of forest products; collection of forest products is a specialised activity based on acquired skills and an ecological knowledge of the forests; and collection of medicinal plants is shrewd in secrecy and involves the performance of rituals. Net income generated from natural forests by rural women in the study area varies from about N23,000 to N113,080 per household per season. Forest regeneration has received little attention from both the rural communities and government and this tends to undermine sustained use of the forests.

Keywords: Wild biotic resources, rural women, non-timber forest products, gathering, regeneration, medicinal plants, rituals

INTRODUCTION

About 80% of the rural women in Nigeria can be classed as poor, with the average household income from all sources being less than US\$1 per person per day¹ (Osemeobo 2004). In rural areas, about 10% of the households are headed by women (World Bank 1996). The majority of the women have no formal education, with about 15-20% and 5% having completed primary and secondary education respectively (UNDP 1998). Because the rural areas are to a large extent cut off from the benefits of development – such as access roads, safe drinking water, electricity and modern health facilities – the rural women are forced by circumstances to arrange their lifestyles in such a way as to be self-sustaining with little input from urban areas. In addition to poor infrastructure, women face an unfavourable land tenure system that tends to deny them long-term access to land for cultivation and harvesting timber from natural forests, even as members of land-holding communities. The unmarried woman holds inferior rights to her father's farmland, which are lost on marriage. A married woman has no right to land inheritance from either the father or the husband. Only her male children have the right to cultivate

¹ US\$1 equals approximately 132.5Naira, as at December 2004.

the land allocated to their father when the elders of the family give their consent, otherwise, the land reverts back to the husband's family.

The only way a woman can own land is through erecting a building, and it is on this basis that land can be absolutely owned and hence can be sold or inherited on a permanent ownership basis. Gender discrimination forces poor women to depend almost entirely on the forests to meet household needs and fulfil their marital role of ensuring the welfare of the family. This involves childcare, feeding, maintenance of homes, spiritual welfare and other *ad hoc* socio-cultural duties. The latter include preparation of food for festivals and ceremonies, organisation of women groups for community development such as entertainment (dancing groups), training girls for marriage, harvesting crops and collection of forest products (Osemeobo 1993, Osemeobo 2001a).

In the Nigerian rainforest zone, agriculture is the mainstay of the rural economy. In periods of famine, there are limited sources of income to sustain the households. At these times, rural women depend almost entirely on natural forests to sustain the households while the men are engaged in cultural festivals, including masquerades and dancing troupes, which often attract tourists to rural areas. The women engage in harvesting biotic resources, including collection and marketing of non-timber products to generate income for households.

According to Dankelman and Davidson (1988), the main constraints to women's participation in forest management are land tenure and cultural taboos. Traditional institutions (comprising the council of elders, traditional priests and the village head) do not allow women to have their say in proffering solutions to forest management problems on which their welfare is based. Because women's views are often neglected, the traditional and sectoral land-use policies conflict with the options of women in forest resource utilisation and this has led to breakdown of forest protection and of sustainable yield (Osemeobo 2001b).

This paper examines how Nigerian rural women within the rainforest zone sustain their household livelihoods from the natural forests during famine periods in agricultural production. The specific objectives are to:

1. identify the forest products rural women utilise to meet the immediate household requirements;
2. assess the economic value of bio-products collected by women from the forests at household levels; and
3. examine the occupations derived from the use of forest products in rural areas.

The next section describes the study area and forest management system. Next, the research method is outlined. This is followed by a presentation of survey results concerning women in forest utilisation, marketing of forest products, the economics of non-timber forest products (NTFP) collection by women, problems of forest management and the conservation of plant species. Finally, conclusions and policy implications are drawn.

THE STUDY AREA

The study area – the lowland rainforest of southern Nigeria – is located between latitudes $4^{\circ} 30' \text{ N}$ and $7^{\circ} 30' \text{ N}$, and between longitudes $2^{\circ} 30' \text{ E}$ and $9^{\circ} 30' \text{ E}$. It is a relatively narrow strip of land, 50 to 250 km in width, running from west to east. Seven states (Abia, Akwa Ibom, Cross River, Edo, Imo, Ogun and Ondo) have about three quarters of their area within the rainforests while another three states (Delta, Oyo and Rivers) have about a quarter or less of their area within the rainforests (Figure 1).

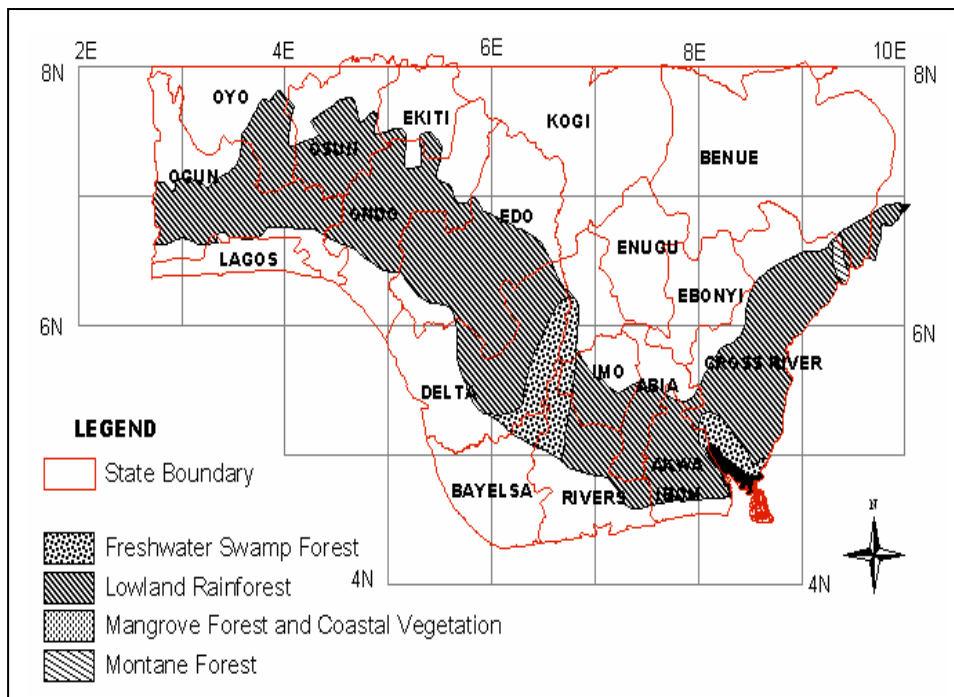


Figure 1. Location of the lowland rainforest of southern Nigeria

The rainforest exhibits a complicated mosaic of communities. The dominant species belong to the families *Meliaceae* and *Leguminosae*. The primary objective of rainforest management is to improve the production of timber and to promote a sustained supply of non-timber forest products. Management of rainforests is based on trial and error due to inadequate knowledge of the ecology, biology and silviculture of the forests. Thus in the 1950s and 1960s the forests were subjected to various management systems, including enrichment plantings, the uniform Tropical Shelterwood System (TSS) and plantation regeneration. In the TSS, forests classified as suitable for timber production were divided into annual coupes to permit a harvest rotation of 100 years. The forests were divided into four 25-year periodic blocks, in which a harvested block was left to regenerate for 100 years before it could be re-harvested.

The rainforests are open to timber and non-timber harvests both in government forest reserves and outside these (free areas). In the latter, trees and wildlife species

defined by government as economic, are harvested on permits based on payment of a token fee to the Forestry Department and land rent to the native landowners. Because the state forestry laws are outdated, having not been revised in the past three decades or so, the tariffs prescribed for biodiversity exploitation in and outside the reserves do not reflect the true market values of the products. Consequently, as the revenues derived from the forests declined, there was strong agitation for de-reservation of natural forests to provide land for agricultural production, which had been a more viable economic venture for the rural people. By 1992 many forests were de-reserved in various states in the rainforest zone, including Edo and Delta states (527 km² de-reserved), Cross River (108 km²), Imo (4 km²), Ogun (0.4 km²), Ondo (2 km²) and Rivers (1 km²) (Osemeobo 2004). De-reservation further reduced the area of land available for rural women to harvest bio-resources for household needs.

RESEARCH METHOD

Twelve settlements were selected by multistage sampling, and then households were selected at random from these settlements. This selection process involved the use of an ecological map of Nigeria, from which the states occupying the rainforest zones were identified and listed in alphabetical order. Using a table of random numbers, four states (Edo, Ekiti, Abia and Akwa-Ibom) were selected for data collection. In each of the selected states, six rural settlements with existing forestlands were identified and three each were selected from each of the four selected states. A pilot visit was conducted in the 12 selected settlements to gain an understanding of their terrain, the housing pattern, the level of exploitation and use of wild bio-resources, and the times when potential respondents would be available for interviewing.

Selection of respondents for the interviews involved a stratified sampling procedure. A 10% sampling fraction was used to select households in each settlement area, and then one adult woman involved in the collection of non-timber forest products in each of the selected houses was selected. A total of 245 rural women were included, from 12 settlements in the states of Edo, Ekiti, Abia and Akwa-Ibom (Table 1).

Data were collected through: (1) interviews with a set of questions on forest resource utilisation, prices, processing, storage, transportation, product selling and tenure issues; (2) group discussions with market women to validate prices of inputs and outputs in the marketing of forest resources collected during the interview; and (3) visual observations of women's activities to validate the information on forest resource utilisation and employment generation for women, and to identify the species of flora and fauna collected.

A questionnaire was developed, and tested through a pilot survey, and questions not adequately understood were adjusted to provide greater clarity for respondents. The final version is provided in Appendix A. Some questions were open-ended to give the respondent an opportunity to present opinions.

Table 1. Sample size by settlement area

State	Selected settlements	Number of householders selected for interview	Number of respondents in each state
Abia	Awarra	17	58
	Amaigbo	19	
	Uralla	22	
Akwa Ibom	Eket	20	64
	Oron	26	
	Abak	18	
Edo	Okomu	24	62
	Iguobazuwa	18	
	Ologbo	20	
Ekiti	Ikere	21	61
	Ise	20	
	Ikole	20	
Total	12	245	245

SURVEY FINDINGS

Women in Forest Utilisation

The main activities carried out in the forests by women were found to be harvesting of non-timber forest products, including firewood, fruits, nuts, leaves, mushrooms and medicinal herbs. Firewood collection is carried out at two levels. The collection of dead wood in the forest has not met household demand for fuelwood in recent years due to an increase in the number of collectors and the decreasing area of land under natural forest cover. Consequently, firewood collectors now resort to the felling of standing shrubs and trees. Women often employ labour to fell and crosscut trees for ease of transportation. The consequence of excessive fuelwood harvest is reduced density of preferred species for fuelwood production.

Gathering of NTFP by women is a specialist occupation, the techniques for which are based on traditional knowledge in terms of understanding the ecology of the forests. These traditions are often based on myths, rituals, taboos and secrecy, which manifest particularly in the collection of medicinal plants. In the survey, respondents explained the different conditions in which medicinal plants are harvested in the forests. It is common to sanction or ban those who fail to observe the various rituals in the collection of medicinal products from natural forests. Those that undertake the collection of medicinal plants are traditional medicine men or women 'that understand the language of the herbs'.

The access regimes for the collection of medicinal plants are difficult to understand because most are held in secrecy. Some of the rituals performed by respondents include:

1. Making sacrifices at the base of a tree before parts of the tree are harvested; otherwise the medicines made from it will not be effective. The various sacrifices made by collectors of medicines are determined by the divination carried out by the harvesters. This was noted in the collection of parts of the

species of *Okoubaka aubrevillei*. Fewer than 20 standing trees of this species remain in the country.

2. Rituals including dancing around the tree naked and with closed eyes are often performed for harvesting parts of *Milicia excelsa* if the collection is to be used for mystical purposes.
3. Some plants are harvested for traditional medicine by raising either the left or right leg to maintain the efficacy in use, as is the case in *Talinum alata* and *Agetatum conyzoides*.
4. Some plants used for trado-medical (magical) preparations, including *Euphorbia hira*, are collected at about noon when the sun is at *the centre of the sky*. In contrast, others including *Vitex doniana* and *Amonidium mannii* used for enriching fertility in women and men, are usually harvested at night or early in the morning. Some plants including *Palisota hirsute* and *Canarium schweinfurthii* which are used for despoil (to harm or correct deviants in the society) are harvested by closing one or both eyes after sighting the plant and making incantations at the base of the plant.

Some of the numerous sellers of medicinal herbs in open markets were interviewed to check whether these rituals are carried out before the herbs they sell are collected. Approximately 65% said they do not know while the remaining 35% said that the rituals are performed. Discussions were also held with key users of medicinal herbs (traditional medicine practitioners) to determine the efficacy of the rituals performed during herb collection. There were two major views. The first view is that rituals are effective and realistic, particularly for herbs collected for trado-magical preparations. These preparations include preventing rainfall in the wet season for important festivals and forcing rain to fall in the dry season to pave way for cultural ceremonies; medicines against gunshots and accidents in vehicles and canoes; and charms against harmful witchcraft activities. The second view is that rituals in herb collection serve to protect practitioners of traditional medicine in business. The somewhat tedious rituals performed in herb collection tend to reduce the number of people interested in the collection of medicinal plants and in the practice of traditional medicine. It also helps to protect choice species from overuse. In rural areas, traditional medicinal practice is based on family lines and practicing secrets are passed from one generation to the next, in specialised areas of gynaecology, physiotherapy, paediatrics and psychiatrics. Each family line is known for its specialisation in traditional health care. The secrets of treatment in each special area in terms of species of plants or animals in use, parts of plants and animals used, season of herbal collection, time of the day for herbal collection, processing methods for ingredients, drug preparation and applications and storage of drugs are held in secrecy within family lines.

Collection of snails is a wet season activity for rural women. In the study area, snail collection was carried out at night (midnight to 4 am). There is high demand for snails in the rainforest zone for food, cash, traditional medicine and rituals. Habitat destruction has reduced the snail population in natural ecosystems in the last decade. The common species that meet the economic and socio-cultural needs of the people are *Archachatina marginata*, *Helix pomatia* and *Limicolaria aurora*.

The collection of mushrooms from the wild is also seasonal and mainly takes place in the wet season. Because some species of mushrooms are poisonous, only the people who understand their biology and ecology are fully engaged in their collection and marketing. It was observed that over 20% of mushrooms collected from the wild were lost due to nematode infection and rot. Mushrooms (particularly *Termitomyces microcarpus*) are used as delicacies in soups and in traditional medicines. Like the snails, mushrooms are in decline because of the high rate of vegetation loss and habitat destruction.

Gathering also involves harvesting of leaves for wrapping food (*Thaumatococcus daniellii*), soup condiment (*Lasianthera africana*), fruits for spices (*Piper guineense*) and flowers of plants for soap making (*Elaeis guineensis*). These activities greatly affect the productivity of the species because intensive pruning limits regeneration due to reduced seed production. These activities are widespread in the forests because the species used for soup condiments occur in low densities of an average of between 0.1 – 1.6/ha (Okafor 1981). In addition, most of the species are known to occupy narrow ecological sites (except *Elaeis guineensis*) and are thereby adversely affected when the natural forests are destroyed for agricultural production.

Forest exploitation was found to be a part-time occupation for 68.4% of the respondents (Table 2). The three common forest activities were gathering (21.4%), production of oils (20.5%) and collection of medicinal plants (18.3%). In terms of gathering, the collection of snails (16.2%) was also a prominent activity.

Table 2. Women's activities in forest resource utilisation

Forest activity	Proportion of respondents (%)	Proportion of part-time resource users (%)	Proportion of full-time resource users (%)
Gathering of leaves, ropes, mushrooms, fruits and nuts	21.4	16.0	5.4
Fuelwood production	13.4	9.6	3.8
Collection of snails	16.2	16.2	0.0
Medicinal plant collection	18.3	10.3	8.0
Production of oils from seeds/nut	20.5	6.1	14.4
Production of soap/body decorations	10.2	10.2	0.0
Total	100.0	68.4	31.6

Marketing of NTFP

Women gatherers of NTFP have four options of disposing their products: (1) sale of unprocessed NTFP to middlemen on wholesale basis, (2) sale of processed products on wholesale basis, (3) sale of processed products on retail basis; and (4) use of products for household consumption. Some women specialise in different aspects of the NTFP business including: harvesting, transportation from the forests to

settlements, processing and sale of items. Processing of NTFP is carried out by the traditional methods indicated in Table 3. A gatherer may carry out all the activities when the harvest is small, but in bulky harvests specialised workers are engaged in different aspects of the marketing business. Delay in processing of NTFP often leads to loss of products from rot and infection by bacteria, fungi or insects, particularly for perishable products such as mushrooms and edible fruits (*Chrystophyllum albidum* and *Irvingia gabonensis*).

Table 3. Processing of NTFP by women

NTFP	Processing method
Leaves	Sorting and grading of leaves according to quality for wrapping food items Packaging for the market
Mushrooms	Sorting of mushrooms for end uses (food and medicines) Sun drying of mushrooms Grading according to quality Packaging for sale
Snails	Sorting snails according to species Grading of snails according to species Packaging of snails for the market
Fruits and nuts	Sorting of fruits and nuts according to species Extraction of seeds from seeds or nuts Sun drying of seeds Grading according to quality Packaging for sale
Medicinal plants	Sorting of products according to species Drying of species (sun drying or open air drying in shade) Packaging of products for sale
Firewood	Sorting out according to end uses (low burn and high burn) Arrangement of firewood in cords for sale

Sale of NTFP at the Household Level and the Open Market Level

During the harvesting season, middlemen often visit the rural areas on a regular basis looking for NTFP to buy. The middlemen advance money to some rural women on request to make specific products available to them on an agreed timeframe. The drawback in receiving an advance from middlemen is that the products on which the advance has been received are often sold at lower prices compared with those sold directly by the gatherer.

While storage facilities for processed NTFP are limited, some women store some nuts and seeds from the harvesting season until the market value increases. This is the common practice in high valued seeds including *Irvingia grandifolia*, *Irvingia gabonensis*, *Parkia biglobosa* and *Parkia bicolor*. The storage is often in clay pots of varying sizes designed specially to store seeds. Before storage, seeds are well dried to prevent mould, and the surfaces of pots are treated with oil palm for protection from insects and fungal infestation.

Employment Generation for Women

Often, rural women are engaged in domestic and commercial-based household tasks that keep the families together in their communities. The women are forced by traditional obligations to contribute substantially to the household budget. As indicated in Table 4, gathering within a household can employ one woman for 12 months (or 3 women for 4 months), fuelwood collection 9 months, collecting medicines 7.5 months and snail collection 8 months. Table 4 also reveals that the processing and selling of forest products are highly labour intensive.

Table 4. Household employment generation by gathering and production of oils and soap in person-months per annum

Women's occupation	Raw materials	Processing	Transport	Storage	Selling	Total
Gathering of leaves, ropes, mushrooms, fruits/nuts	4	1	2	1	4	12
Fuelwood collection	4	1	0.5	1.5	2	9
Collection of snails	3	1	0.5	0.5	3	8
Medicinal plant collection	2	3	0.5	0.5	1.5	7.5
Production of oils from seeds/nut	6	10	1	3	4	24
Production of soap/body decorations	4	3	1	1	1	10
Total employed per month	23	19	5.5	7.5	15.5	70.5

Economics of NTFP Harvested by Rural Women

The financial analyses of NTFP harvested and utilised by rural women in the study area are reported in Table 5. Calculation of inputs and outputs is based on the household unit, and on market prices. The rate for hired labour was used to estimate labour costs. Household income and expenditure were calculated on the basis of the periods the goods and services were supplied and rendered respectively. Because each respondent was mainly preoccupied by a single forest activity, and each sub-activity was carried out by paid labour, it was simple to estimate the annual expenses for the activities.

Table 5 indicates that: (1) the annual net income derived from NTFP by rural women at a household level varies from N113,080 for oil production, through to N60,000 for soap making and body decoration, N56,650 for gathering, N52,052 for fuelwood collection, N46,465 for snail collection to N23,000 for medicines; (2) the main products with high costs of labour in the production process are production of edible oils N27,000, gatherings of leaves, fruits, seeds and nuts N21,600 and soap production N18,000; and (3) the least capital-intensive products are collection of medicinal plants N13,500, collection of snails N14,400 and fuelwood collection N16,200.

Table 5. Annual values of incomes derived NTFP by rural women

Women's occupation	Expenses					Total income per year (N)	Total net income per year(N) (Col 7 – sum Col 2-6)
	Raw material (N)	Processing (N)	Transportation (N)	Storage (N)	Marketing and other costs (N)		
Gathering of leaves, ropes, mushrooms, fruits/nuts	7,200	1,800	3,600	1,800	7,200	78,250	56,650
Fuelwood and charcoal production	7,200	1,800	900	2,700	3,600	68,252	52,052
Collection of snails	5,400	1,800	900	900	5,400	62,865	48,465
Medicinal plant collection	3,600	5,400	900	900	2,700	36,500	23,000
Production of oils from seeds and nuts	10,800	18,000	1,800	5,400	7,200	158,280	113,080
Production of soap and body decorations	7,200	5,400	1,800	1,800	1,800	78,000	60,000

Problems of Forest Management and Reforestation

Table 6 presents a list of some of the indigenous plant species that meet the requirements of women for food and financial security at household level. Unfortunately, the characteristics of these plants make them difficult to be regenerated under *ex situ* measures. These include: (1) slow growth rates of 1.5 – 2.5m³/ha/yr; (2) irregular fruiting within and between species in the same habitat; (3) low variability of seeds when collected for regeneration of the forests; (4) low quantity of seed production of most trees; (5) low number of trees of the same species per hectare of land; and (6) low coppicing abilities (Lamprecht 1978). The ecological and biological characteristics of these plants make their management in man-made plantations difficult. In the few cases where indigenous trees were planted in plantations, the costs of establishment were too high and clearly beyond the scope of budgetary allocations to the forestry sector. The further problems of browsing by wild animals, fire and dieback in plantations, also create difficulties in establishment of large-scale plantations of indigenous species for timber and pole production. As a result, there is heavy reliance on natural forests for production of timber and poles for domestic and export requirements. Apart from practitioners of traditional medicines and few stands of fruit trees planted in homesteads or distant farms, there has been no conscious effort by government or the civil society to raise more than small areas of NTFP for domestic use or for export.

Table 6. Major species used by rural women for household security

Wild biotic products	Major species that meet the requirements
Firewood	<i>Anogiessus leiocarpus</i> , <i>Anogiessus latifolia</i> , <i>Azelia africana</i> , <i>Moringa oleifera</i> , <i>Parkia biglobosa</i> , <i>Nauclea diderrichii</i> , <i>Trichilia hirta</i> , <i>Trema guineensis</i> , <i>Trema orientalis</i> , <i>Burkea africana</i> , <i>Terminalia glaucescens</i> , <i>Mitragyna africana</i> , <i>Parkinsonia aculeate</i> , <i>Daniella oliveri</i> and <i>Dialium guineensis</i> .
Medicines	<i>Alchornea cordifolia</i> , <i>Spondias mombin</i> , <i>Combretum racemosum</i> , <i>Acanthospermum hispidum</i> , <i>Vernonia amygdalina</i> , <i>Byrsocarpus coccineus</i> , <i>Phyllanthus muellerianus</i> , <i>Sansevieria liberica</i> , <i>Cissus aralioides</i> , <i>Acanthus montanus</i> , <i>Desmodium Scopiusurus</i> , <i>Nauclea latifolia</i> , <i>Sida urens</i> , <i>Triclisia patens</i> , <i>Desmodium velutium</i> , <i>Aphania senegalensis</i> , <i>Gloriosa superba</i> , <i>Psychotria vogelii</i> , <i>Aldornea cordifolia</i> , <i>Cissus arabides</i> , <i>Costus afer</i> , <i>Cyclosorus afer</i> , <i>Hannoe undulata</i> and <i>Cassia rotundifolia</i>
Soup and condiments:	<i>Genetun africana</i> , <i>Ceiba pentandra</i> , <i>Moringa oleifera</i> , <i>Andasonia digitata</i> , <i>Vernonia amygdalis</i> and <i>Pterocarpus aerenasious</i> ,
(1) Leaves/fruits	<i>Prosopis africana</i> , <i>Dialium guineense</i> , <i>Tamarindus indica</i> and <i>Monodora myristica</i>
(2) Nuts/seeds	<i>Irvingia gabonesis</i> , <i>Azelia africana</i> , <i>Parkia biglobosa</i> , <i>Parkia bicolor</i> , <i>Pentaclethra macrophylla</i> and <i>Irvingia gradifolia</i>
(3) Oils	<i>Elaeis guineensis</i> , <i>Baillonella toxisperma</i> and <i>Ricinus communis</i>
(4) Spices	<i>Afromomum melagueta</i> , <i>Pipper guineense</i> and <i>Xylopia aethiopica</i>
(5) Mushrooms	<i>Agaricus campestris</i> , <i>Aleuria aurantia</i> , <i>Cookenia suisipes</i> , <i>Mycena prolifera</i> , <i>Ramaria moelleriana</i> , <i>Termitomyces globules</i> , <i>Termitomyces microcarpus</i> , <i>Volvariella esculenta</i> , <i>Polyporus dermoporus</i> , <i>Chlorophyllum molybditis</i> , <i>Phlebopus silvaticus</i> , <i>Coprinus micaceus</i> and <i>Lentitus tuberrigium</i>

The perception of the rural women involved in harvesting bio-resources as to what would happen to them when the forests are degraded was examined, the question posed being: 'What would you do if the forests you depend on for survival is depleted?' Responses included:

- 'I don't think the forests can go so easily'
- 'The forests will not go in my time'
- 'If the forests go, I will myself'
- 'If the forests vanish I will go to the town'
- 'I cannot easily say what I will do if the forests are destroyed'
- 'Why not the forests go first?' (That is, the forests should be degraded first before thinking of what to do.)
- 'Where shall we be looking when the forests want to go away? God forbid'
- 'The forests are already going. We are planting what I need on my farm but not all'
- 'I will change my occupation and start trading in food items'
- 'Our God will salvage our situation'.

The views appear to indicate a strong feeling among the respondents that the forests will not disappear in the near future. The management of the forests in terms of NTFP is virtually nonexistent and this does not encourage intensive harvesting regimes in the forests, which is required under increasing demands for goods and services.

Conservation of Plant Species

Conservation of biodiversity among rural communities is fraught with problems, including: (1) lack of defined roles for biodiversity conservation among members of the community; (2) lack of organised conservation groups; (3) lack of synergy between the Forestry Departments and the rural communities in forest management and conservation; (4) lack of inventory for forest resources; and (5) lack of management plans for the forests. Within these setbacks the management of NTFP is not on the priority list of the forestry departments.

The main problem of species and habitat conservation in the study area hinges on lack of data on the forests. The number of standing trees and their volumes in the forests are not known, nor are the diversity of species and the rates of depletion and regeneration. The silvicultural practices applied to the natural forests (protection from fires, coppicing management, pest control) are inadequate. The 36 state forest departments are faced with inadequate funds to manage the forests, yet the revenue generated from the forests is transferred to a consolidated revenue fund. At present the forests are managed by forestry officers but with inadequate information about the resource stocks, ecology and their occurrence, population and diversity of the biodiversity.

CONCLUSION AND POLICY IMPLICATIONS

The survey has revealed that rural women in the rainforest area are fully engaged in harvesting and utilising bio-resources to sustain financial and household security. Collection of NTFP is a specialised activity based on the ecological knowledge of the forests, and the collection of medicinal plants is influenced by myths, taboos, secrecy and rituals. Marketing of NTFP by rural women is organised within traditional methods. The annual net income derived from NTFP by rural households varies from N46,465 to N113,080. Unfortunately, conservation of NTFP is not the priority of forestry departments and the rural communities at present.

The study also shows that the people have relatively unrestricted access to forests, and income from NTFP is particularly important to poorer groups within the community. The ease of entry into the forests and the ability to combine forest exploitation with other household tasks means that the forests are an important source of income that women can draw on to sustain rural livelihoods. However, because these activities do require some level of skills, capital and labour, the very poor in the communities find it difficult to take advantage of opportunities presented by the forests. The land tenure system is not an impediment to access to the forests by women hence access to bio-resources, rather than ownership, is of crucial importance to poverty reduction.

Conservation roles women can play that may not hinder their dependence on the forests but enhance their occupations include regeneration of species at homesteads,

protection of wildlings on farms and in natural ecosystems, adoption of environmentally friendly harvesting practices, forest protection, and awareness building among stakeholders. These roles can be carried out effectively under organised women's groups including cooperatives, thrift societies, age-group associations and marketing associations. The women involved in the forest product business in the study area are working in isolated groups that need to be brought together and trained in the new roles they should undertake to sustain the dwindling NTFP in the study area. The burden of effectively regenerating NTFP is beyond the capability of rural women. Government intervention is needed in conservation and marketing of NTFP to provide the necessary infrastructure. According to Carney (1998), this could be derived through: (1) increasing the flow of marketing information and improvement in the rural infrastructure including roads for easy access to the markets; (2) promoting risk-reducing technologies, improvement of legal foundations, law enforcement and use of contract systems; and (3) application of fiscal measures to make the trade attractive. The conservation component should focus on activities that are centred on poverty reduction and sustained utilisation of the forests.

What is needed to improve the quality of life in forest-dependent areas of Nigeria is a properly coordinated package, not a fragmented approach. In the past, conservation programs have often treated local people as opponents rather than partners. Specific measures that can be taken are needed to safeguard vulnerable species and habitats of importance to rural economies. The immediate focus is to enable the poor to gain access to improved technologies in the utilisation of bio-resources. This could be done through: (1) acquisition of skills on improved marketing of forest products in areas of harvesting, processing, preservation and packaging; and (2) marketing promotion and information.

By generating rural employment the rainforests contribute to social stabilisation of rural communities. However, the roles of the women are under threat from inadequate conservation and management of the forests. Unfortunately, it appears that the rural people are working against time because the forests and the indigenous knowledge of the ecosystems are disappearing with large-scale deforestation thereby increasing poverty among the women. Forest management policies that are based on social institutions with full participation of women and the poor should be among the priorities of forest management at community level.

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Appendix A

Questionnaire on Women Living on the Forests

I. Forest-based Activities

1. In what major activities are you engaged in the natural forests to support your household out of the following? Gathering of leaves ____, fruits ____, nuts ____, seeds ____, fuelwood ____, insects ____, snails ____, mushrooms ____, medicinal plants ____, others specify ____

II. Marketing of Forest Products

2. What methods do you apply to process forest products including leaves ____, fruits and nuts ____, mushrooms ____, firewood ____, medicinal plants ____ etc immediately after harvest?
3. How are the processed forest products stored? ____ Are there storage facilities for processed forest products at community levels? Yes ____ No ____
4. Describe the marketing channels for the forest products you harvest?

III. Access Regimes

5. (a) What are the guiding rules for harvesting forest products? ____; (b) Are there access regimes for harvesting forest products? Yes ____ No ____; (c) What are these regulations? ____; (d) Explain the tenure issues involved in collecting forest products in your settlement.

IV. Management and Utilisation of Forest Resources

6. (a) Are you engaged in regenerating the forests after harvesting the products? Yes ____ No ____; (b) Give reasons for your answer in 6 (a) above _____
7. What are the problems of forest management in your area? _____

8. List the common plants utilised for the following activities at household level. Firewood ____, medicinal plants ____, leaves for food ____ and for wrapping food ____, edible fruits ____, nuts and seeds ____, oils ____, spices ____ and mushrooms ____

9. What would you do if the forests you depend on for survival, is depleted?

V. Economic Estimates

10. What is the unit of measure for selling forest products? Leaves ____, fruits ____, nuts ____, mushrooms ____, medicinal plants ____, snails ____, oils ____, soaps ____ and others (specify) ____

11. (a) What is the current market price for each unit of the following products? Leaves ____, fruits ____, nuts ____, mushrooms ____, medicinal plants ____, fuelwood ____, snails ____, oils ____, soaps ____ and others (specify) ____; (b) What is the current labour wage for rural women in your settlement? N ____; (c) How many hours make a person-day (number of hours that determine the suitability for a day's pay)? ____; (d) How many person-days make a person-month? ____.

12. Give estimates in Naira or person-days or person-months for the listed activities by your household per annum as indicated in the table below including: harvesting costs ____, processing costs ____, transportation costs ____, storage costs ____, costs of selling products ____

Activity	Harvesting N	Processing N	Transportation N	Storage N	Selling N
1. Leaves, fruits, nuts and mushrooms					
2. Fuelwood					
3. Collection of snails					
4. Collection of medicinal plants					
5. Production of oils					
6. Production of soaps					
7. Others, specify					
8. Number employed in activities					
9. Type of employment: (a) Full-time (number of weeks)					
(b) Part-time (number of weeks)					